

Refrigerant 21 Specifications & DOT Shipping Information



CHARACTERISTIC	PROCURED	DELIVERED/RECOVERED
Specification:	Fed Spec BB-F-1421, Type 21 (now obsolete)	SE-S-0073, Table 6.3-20
Boiling point	48.1 °F +/- 2 °F 29.92 in Hg	48.1 °F +/- 2 °F (max)
Water content	.001% by wt. (max)	15 ppm by wt.
Boiling range	.5 °F (5% to 85% distilled)	N/A
Chloride ion	None by test	0.3 ppm by wt. (max)
*Air in vapor phase (Tested in Original Container)	1.5% by volume	N/A
High boiling impurities	.01% by volume (max)	N/A
**Dissolved air	N/A	0.02% by wt. (max)

* Analysis for air in vapor phase may be by gas chromatography.

** Analysis for dissolved air to be by gas chromatography as noted in SE-S-0073, Table 6.3-20.

NOTE: JBOSC provides 20-micron absolute filtration on the loading system for refilling cylinders and the S70-0797 units.

Usage and Other Data: R-21 is chemically dichloromonofluoro methane (CHCl₂F). R-21 is used in the Shuttle's Environmental Control and Life Support System as a heat transfer fluid that removes heat from inside the Shuttle orbiter and radiates it into space via the radiator panels that are on the inside of the payload bay doors. R-21 is available in KSC DOT106 (one ton) cylinders, shown below, or KSC 150-pound capacity DOT3A cylinders. All R-21 transfers use a near-zero-loss recovery system also shown below. R-21 is recovered and reused after processing through a [molecular sieve](#) and filters to reduce any moisture and particulates.

Proper Shipping Name and Container Markings:

49 CFR 172.101 Hazardous Materials Table

Sym-bols	Hazardous material descriptions & proper shipping names	Hazard Class or Division	Identifi-cation numbers	PG	Label Codes	Special Provision	Packaging (173.***)			Quantity Limitations		Vessel Stowage	
							Excep-tions	Non Bulk	Bulk	Passenger aircraft/ rail	Cargo aircraft only	Loca-tion	Other

DOT Hazardous Material Codes and Regulations will explain the letters and numbers.

Sample Table

	Dichlorofluoro- methane or Refrigerant gas R21	2.2	UN1029		2.2		Packaging 64(173.***)			Quantity Limitations		Vessel Stowage	
							306	304	314, 315	75 kg	150 kg	A	



Markings for a "bulk container" (over 119 gallon capacity) with 12"-sided placards. An authorized variance would have the identification number replace the words on the primary hazard placard (with the number at the bottom corner). Non-bulk containers would use the similar 3"-sided labels and have "UN(ID#)" nearby. The proper shipping name would also appear near the labels or placards.



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